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THE BRYOLOGIST

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THE RHACOMITRIUMS OF WESTERN NORTH AMERICA

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The genus *Rhacomitrium* has given more or less trouble in regard to the identification of the western species because a number have been described insufficiently, sometimes no drawings were made to show what the description was based on; and because a number of species usually recognized as such are quite close in their approach to each other. It is hoped that this may prove to be of value to those who find difficulty with western material:

RHACOMITRIUM

Plants mostly branched. Stem without central strand, with rhizoids only at base. Leaves with or without hyaline point, lanceolate; vein extending to tip except in *R. palmeri,* margin mostly entire except the hyaline point; surface often sunken over the cell-cavities or over the walls. Cells strongly sinuose, the lower usually elongated, the upper isodiametric to elongated. Dioicous. Calyptra mitrate, rather long-beaked. Seta straight or curved, twisted to the right or left. Capsule oval to cylindric, smooth, with stomates. Lid conic, with long beak; beak ⅛ to once the length of the capsule-body. Annulus present. Peristome single; teeth divided to below the middle into 2–3 divisions, with swollen joints. (Gk. *rhakos*=frayed, *mitrion*=a cap; referring to the fringed calyptra.)

KEY TO THE SPECIES

A. Upper green leaf-cells isodiametric or nearly so.
  B. Hyaline points lacking on all leaves, even on those of the branch-tips.
    C. Leaves with 2–4 ridges several cells high on the under side of the vein. 1. *R. patens*
    CC. Leaves without ridges on the vein.
      D. Leaves distinctly papillose on both sides; seta twisted to the left. 10. *R. canescens*
      DD. Leaves not papillose; seta twisted to the right.
        E. Isodiametric leaf-cells restricted to the marginal row above, and to a few cells in the tip; capsule-body 3.3–3.8 mm. long. 9. *R. varium*
        EE. Isodiametric leaf cells predominating above except in the vein; capsule-body 2.6 mm. or less long.

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[*] The writer is indebted to Mrs. E. G. Britton, R. S. Williams, J. W. Bailey, and J. M. Macoun for assistance.

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F. Plants reddish; leaves less than 1.5 mm. long; cells greatly bulging on the upper leaf-surface. 4. *R. cyclodictyon*

FF. Plants green to blackish; leaves 2 mm. or more long; cells not or hardly bulging on the leaf-surface.

G. Leaf-tip rounded, often toothed, but sometimes entire. 2. *R. aciculare*

GG. Leaf-tip bluntly pointed, entire.

H. Leaf-margin 1 cell thick throughout; short tuft-like lateral branches 0 to few. 3. *R. depressum*

HH. Leaf-margin more than 1 cell thick above; short tuft-like lateral branches many. 1. *R. affine*

BB. Hyaline points present on some leaves, at least on some of those of the branch tips.

I. Leaves plainly papillose on both sides; seta twisted to the left. 10. *R. canescens*

II. Leaves not or hardly papillose.

J. Leaves with 2–4 ridges several cells high on the under side of the vein; seta twisted to the left. 8. *R. patens*

JJ. Leaves without longitudinal ridges on the vein; seta twisted to the right.

K. Isodiametric cells restricted to the marginal row above, and to a few cells in the tip; capsule body 3.3–3.8 mm. long. 9. *R. varium*

KK. Isodiametric cells predominating above except in the vein; capsule-body 2.4 mm. or less long.

L. Leaf-margin only 1 cell thick throughout. 5. *R. heterostichum*

LL. Leaf-margin more than 1 cell thick near the tip.

M. Hyaline leaf-points acute, always present on some leaves of the branch-tips; short tuft-like lateral branches 0 to few. 6. *R. sudeticum*

MM. Hyaline leaf-points blunt, always present on some leaves of the branch-tips; short tuft-like lateral branches 0 to few. 7. *R. macounii*

MMM. Hyaline leaf-points none at all or blunt or few; short tuft-like lateral branches many. 8. *R. affine*

AA. Upper green leaf-cells 2 or more times as long as wide.

N. Leaves with papillose hyaline points, or if all leaves without hyaline points the green cells papillose; seta twisted to the left.

O Green cells papillose on both leaf-surfaces; upper green leaf-cells 1–2 times as long as wide exclusive of vein. 10. *R. canescens*

OO. Green cells not papillose except within a few cells of the hyaline point; upper green leaf-cells 2–8 times as long as wide exclusive of vein. 11. *R. lanuginosum*

NN. Leaves wholly without papillae; seta twisted to the right.

P. Vein extending to the leaf-tip or very nearly there.

Q. Most of the leaves with hyaline points; seta 4–5 mm. long; capsule-body 1.8–2.1 mm. long; peristome-teeth about .6 mm. long; leaf-surface depressed over the cell-wall. 12. *R. microcarpum*

QQ. Usually at least some of the leaves of the branch-tips with hyaline points, but sometimes all muticous; seta 10–14 mm. long; capsule-body 3.3–3.8 mm. long; peristome-teeth 1.5–1.7 mm. long; leaf-surface depressed over the cell-cavities. 9. *R. varium*

QQQ. None of the leaves with hyaline points; seta 4–12 mm. long; capsule-body 2–2.5 mm. long; peristome-teeth about .6 mm. long; leaf-surface depressed over the cell cavities. 14. *R. fasciculare*

PP. Vein extending only to about the middle of the leaf. 13. *R. palmeri*

ANALYTIC STATEMENTS

Only *R. palmeri* has the vein ending much below the tip.

Only *R. varium* has the capsule-body reaching 3 mm. long.

Only *R. cyclodictyon* is red or reddish-brown.

Only *R. aciculare* has teeth on the margin other than on the hyaline point, and it does not always have them.

Only *R. lanuginosum* has the seta rough.

Only *R. patens*, *R. sudeticum*, *R. affine* and *R. macounii* have the margin more than 1 cell thick toward the apex.

Only *R. canescens* and *R. varium* have the peristome-teeth 1 mm. or more long.

Only *R. sudeticum occidentale* has teeth on the surface of the hyaline point.

Only *R. canescens* has distinct papillae on both surfaces of the leaves; but *R. lanuginosum* has a few near the hyaline point.

Only *R. canescens* and *R. lanuginosum* have papillae on the hyaline point.

Only *R. patens*, *R. canescens* and *R. lanuginosum* have the seta twisted to the left.*

1. RHACOMITRIUM PATENS (Dicks.) Hueb. Muscol. Germ. p. 198, 1833. [*Dryptodon patens* Brid.; *Grimmia patens* B. S. G.]

Plants in loose mats, green to brownish or blackish; stems up to 12 cm. long, with few elongated branches and none to few short tuft-like lateral branches; central strand none. Leaves about 3 mm. long, lanceolate, gradually narrowed, keeled above; when dry appressed, slightly crispate; when wet strongly squarrose; tip usually muticous, often with a few teeth; margins 2 cells thick toward tip, revolute at base; vein about .12 mm. wide near base, with 2–4 longitudinal lamellae on under side; lamellae 1–2 cells thick, 2–5 cells high. Cells strongly convex on surface of leaf, round-quadratic from tip of leaf to below middle and 8–9μ in diameter, greatly elongated from near middle to base; basal cells linear; alar cells rectangular to quadrate. Dioicous. Calyptra mitrate, sometimes almost cucullate. Seta 3–5 mm. long, twisted to the left, curved, yellowish. Capsule horizontal, eventually almost erect, oval, smooth, becoming somewhat grooved in old age, its body 1.6–1.8 mm. long. Lid about ⅓ the length of the capsule

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* Conceive a clock with face turned up. Conceive a moss-plant upright on the face of the clock. If the capsule is twisted in the direction in which the hands of the clock move, the seta is said to be twisted to the right; if in the opposite direction, to the left.

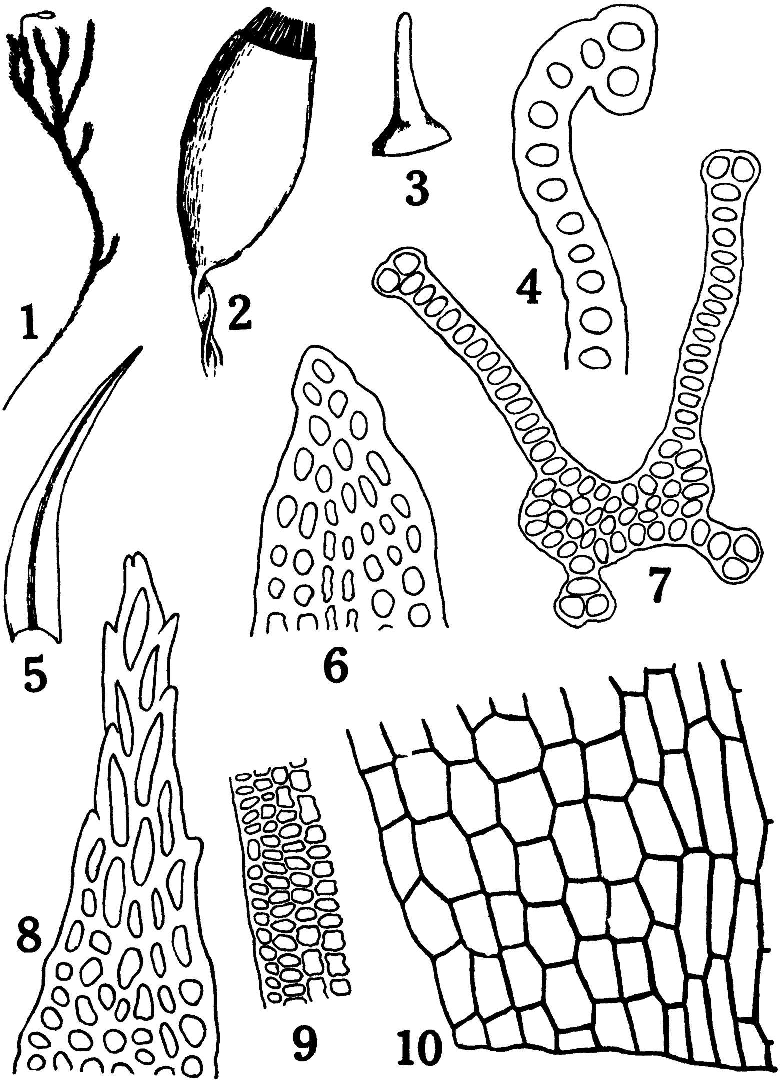

PLATE XX.

Rhacomitrium patens. (1) Plant, ×1. (2) Capsule, ×17. (3) Lid, ×17. (4) Part of cross section of upper portion of leaf, ×550. (5) Leaf, ×07. (6) Tip of rather blunt leaf, ×400. (7) Cross section of upper part of leaf, ×330. (8) Tip of rather pointed leaf, ×400. (9) Cells of leaf-middle, ×400. (10) Cells of leaf-base, including the alar cells, ×400.

body, usually diagonally beaked. Annulus of 3 rows of large cells. Peristome teeth united at base, divided into 2–3 forks to well below the middle, purple, densely papillose, .25–.3 mm. long. Spores 12–16μ.—Alaska to Oregon, Idaho and Montana.

The separation of a poorly defined group under the generic name *Dryptodon* seems to be more confusing than clarifying, and adds nothing to our knowledge of relationships. It does not then seem to have sufficient reason for support.

2. RHACOMITRIUM ACICULARE (L.) Brid. Mant. p. 80. 1819.

Plants rather coarse and stiff, green to blackish-green; stems up to 10 cm. long; elongated branches few; short tuft-like lateral branches none. Leaves broadly lanceolate or lingulate; apex rounded, wide; margin usually somewhat toothed at tip, only 1 cell thick throughout; vein ending a few cells from the tip. Cells of the leaf-tip isodiametric or oval, of the leaf-middle rectangular, of the leaf-base linear. Dioicous. Calyptra mitrate, smooth. Seta 3–14 mm. long, twisted to the right. Capsule oval or almost cylindric, 2–2.4 mm. long; stomates in 3–4 rows; lid beaked, ½–⅔ the length of the capsule-body; annulus of 3–4 rows of cells. Peristome about .7 mm. long, papillose; teeth divided to below the middle into 2–3 unequal divisions. On wet rocks in or at the margins of streams.

The species varies chiefly as follows: (1) the margin of the leaves from entire to distinctly toothed for ¾ the distance to the base; (2) the cell arrangement near the tip from fairly distinct diagonal rows to utter lack of diagonal rows; (3) the length of seta from 3 to 14 mm.; (4) the vein in the inner perichaetial leaves from ⅔ the distance from the base to wholly wanting; (5) the length of the body of the capsule from 2 to 2.4 mm. The nearly ecostate perichaetial leaves are usually but not always concurrent with the shorter setae and smaller capsules; this constitutes *R. nevii.* But short and long setae sometimes occur on the same plant.

TYPICAL.

1. Seta 5–14 mm. long; capsule about 2.2–2.4 mm. long; inner perichaetial leaves with vein indistinct to distinct.—Alaska and Yukon to California and Montana.

2a. **Rhacomitrium aciculare nevii** (Muell.) n. comb. [*Grimmia nevii* Muell.; *Rhacomitrium nevii* Wats.]

1. Seta 3–7 mm. long; capsule about 2–2.2 mm. long; inner perichaetial leaves from ecostate to indistinctly costate.—Alaska to Oregon and Idaho.

3. RHACOMITRIUM DEPRESSUM Lesq. Mem. Calif. Acad. Sci. 1: 14. 1868.

Plants yellowish-brown to blackish-green. Stems up to 13 cm. long; elongated branches none to few per plant; short tuft-like lateral branches none. Leaves obtuse, smooth; margin entire or with suggestions of distant teeth at apex, only 1 cell thick throughout; vein ending a few cells from the tip. Cells of the leaf-tip isodiametric or nearly so, those of the leaf-middle 2–4 times as long as wide and sinuous, those of the leaf-base linear except for the lower few rows. Dioicous. Calyptra (?). Seta 6–8 mm. long, twisted to the right. Capsule sub-

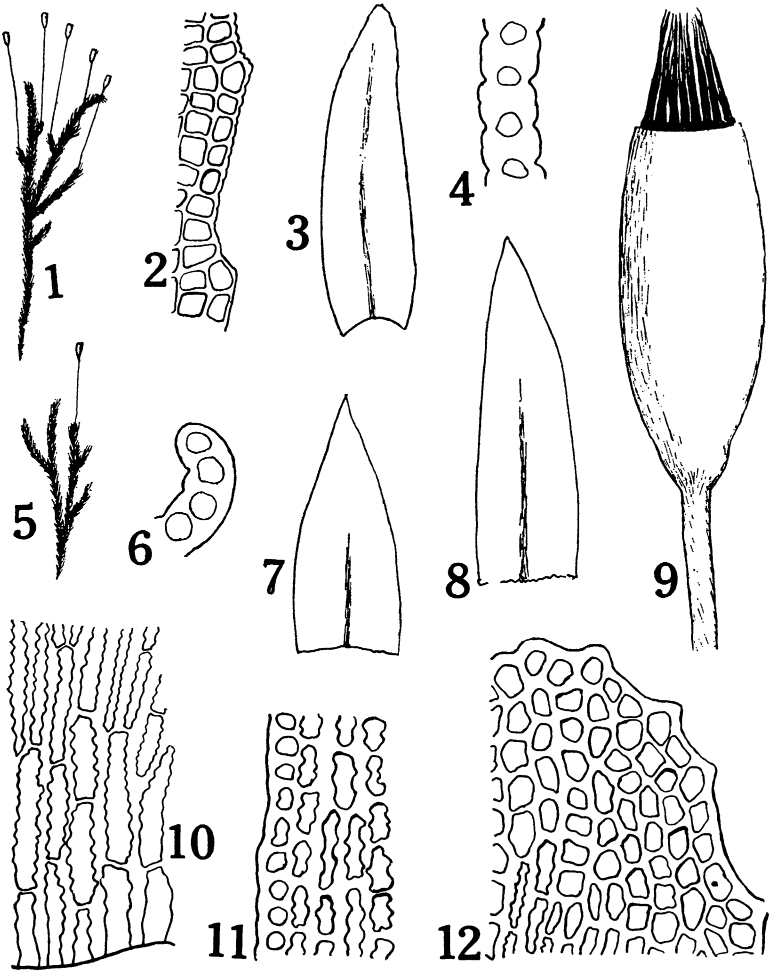

PLATE XXI.

Rhacomitrium aciculare. (1) Plant, ×1. (2) Leaf-margin near tip, ×400. (3) Leaf, ×17. (4) Portion of cross section through lower part of leaf, ×550. (5) Plant, ×1. (6) Cross section through leaf-margin near tip, ×550. (7), (8) Inner perichaetial leaves, ×17. (9) Capsule, ×17. (10) Cells of leaf-base, ×400. (11) Cells of leaf-middle, ×400. (12) Celle of leaf-tip, ×400.

cylindric, not narrowed at the mouth, its body 2.2–2.6 mm. long. Peristome teeth usually divided into 3 or rarely 2 divisions; divisions unequal, smooth.—British Columbia to California.

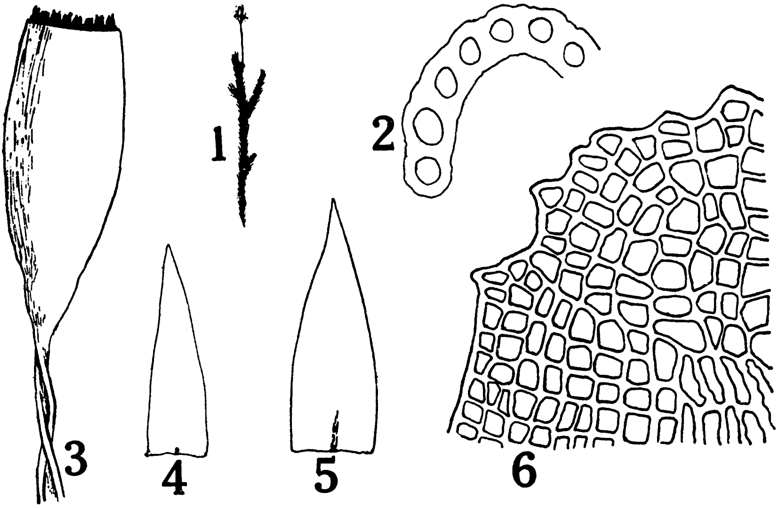

PLATE XXII.

Rhacomitrium aciculare nevii. (1) Plant, X1. (2) Cross section through leaf margin, X550. (3) Capsule, X17. (4), (5) Perichaetial leaves, X17. (6) Cells of leaf-tip, X400.

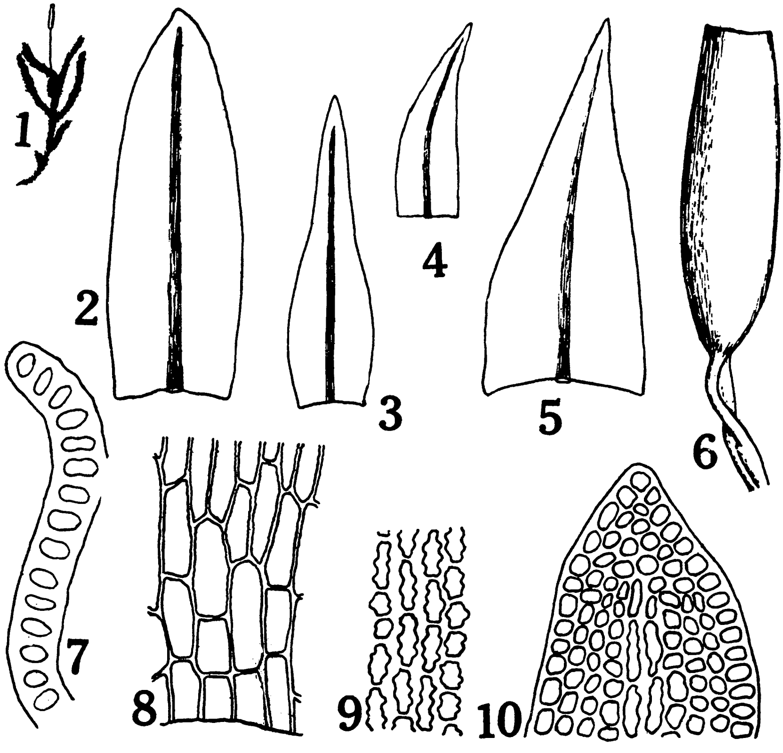

PLATE XXIII.

Rhacomitrium depressum. (1) Plant, X1. (2), (3), (4), (5) Leaves, X17. (6) Capsule, X17. (7) Part of cross section of leaf, X550. (8) Cells of leaf-base, X400. (9) Cells of leaf-middle, X400. (10) Leaf-tip, X400.

The material at hand lacked calyptra and peristome. An examination of Macoun's No. 620 from Victoria, B. C., shows it to be *R. depressum* instead of *R. protensum*. Since the only report of the occurrence of *R. protensum* in the western part of North America seems to be from Macoun's collection near Victoria, its reported presence seems to be due to error. The two species seem to differ in the following:

(*a*) *R. depressum*—Capsule-body about 2.5 mm. long; leaves smooth.

(*aa*) *R. protensum*—Capsule-body about 1.8 mm. long; leaves with paired papillae over the cell-walls.

(*To be concluded in January number*)

UNUSUAL HABITATS

ELIZABETH M. DUNHAM

A student of mosses so soon becomes accustomed to finding certain species in their accustomed habitats that a moss growing out of the usual place at once attracts attention. The following are cases that have interested the writer:

Sphagnum was found on rock on top of a hill at Holderness, N. H., June, 1915. Unfortunately the specimen collected was lost so that the species cannot be given.

Dicranum viride (Sull. & Lesq.) Lindb. grew on trees high above one's head at Upper Dam, Rangeley Lakes, Me., Sept., 1916.

Dicranum montanum Hedw was collected at Upper Dam, Me., Sept., 1916, on rock and on the ground, as well as on trees and decaying logs.

Drummondia clavellata Hook. was collected on rock at Hot Springs, Arkansas, by Mrs. Frank E. Lowe, Jan., 1915.

Ulota ulophylla (Ehrh.) Broth. was found by Heyward Scudder growing on rock at Grand Manan, N. B., June, 1914. It at first seemed probable that the specimen had fallen from a tree and lodged on the rock but, when the locality was again examined, several specimens of the same moss were found on rock and in every case away from trees.

Funaria hygrometrica (L.) Sibth. has been found several times on the mortar between the rocks of stone walls, growing mixed with *Bryum argenteum*.

Mnium cuspidatum (L.) Leyss. was found in the crotch of an old willow by Heyward Scudder in New Brunswick, August, 1914.

Mnium hornum L. was collected in water in Milton, Mass., May, 1916. The growth was so very lax that the species was entirely unrecognizable until placed under the microscope.

Platygyrium repens (Brid.) Bryol. Eur. grows on rocks at North Worcester, Mass. Collected by Mrs. Frank E. Lowe.

Thelia asprella Sull. was also collected on rock by Mrs. Lowe at the limestone quarries at Bolton, Mass. The specimen was determined by Dr. Grout who said he had never heard of this species growing on rock before.